

CLAIMS

1. A tomographic sensor array for mounting on a support within a vessel to enable conditions within the vessel remote from that support to be monitored, comprising a sheet carrying an array of sensors and conductors connecting the sensors to at least one output through which signals may be transmitted which are representative of conditions within the vessel.

2. A sensor array according to claim 1, wherein the sheet is laminar and the conductors are defined by conductive elements deposited on an insulating substrate.

3. A sensor array according to claim 1, wherein the sheet comprises interengaged elongate elements and the conductors are defined by conductive elements within the sheet, the conductive elements being supported by non-conductive elements within the sheet.

4. A sensor array according to claim 2 or 3, wherein the conductive elements are covered by an electrically insulating layer.

5. A sensor array according to claim 4, wherein the sensors are covered by the electrically insulating layer.

6. A sensor array according to any one of claims 1 to 5, wherein the sheet is flexible.

7. A sensor array according to any one of claims 1 to 4, wherein the sheet comprises a series of sections which are interconnected such that at least some of the conductors extend across the interconnections between the sections.

8. A system for monitoring conditions within a vessel a wall of which defines an enclosed space, comprising a sensor array in accordance with any preceding claim, wherein the sensors are distributed within the vessel, a first monitoring unit is located

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within the vessel and connected to each of the sensors, and a second monitoring unit is located outside the vessel, the first monitoring unit comprising means for converting sensor output signals into transmission signals which are transmissible through the vessel wall, and the second monitoring unit comprising means for detecting the transmission signals outside the vessel walls and deriving data representative of conditions within the vessel from the transmission signals.

9. A system according to claim 8, wherein means are provided for transmitting a power signal from outside the vessel to the first monitoring unit, the first monitoring unit comprising a detector arranged to detect the power signal and a power supply energised by the detected power signal.

10. A system according to claim 9, wherein the first monitoring unit comprises an antenna and an associated detector circuit tuned to a predetermined frequency, and a power signal is transmitted at the predetermined frequency.

11. A system according to any one of claims 8 to 10, wherein the vessel incorporates a window, and the first monitoring unit is arranged to transmit optical transmission signals through the window to the second monitoring unit.

12. A system according to claim 11, wherein the first monitoring unit comprises a laser to generate the optical transmission signals.

13. A system according to claim 11 or 12, wherein the optical transmission signals are infra-red signals.

14. A system according to claim 8, 9 or 10, wherein the transmission signals are radio telemetry signals to which at least a part of the vessel wall is transparent.

15. A system for monitoring conditions within a vessel a wall of which defines an enclosed space, comprising a plurality of sensors which in use are distributed within the vessel, a first monitoring unit located within the vessel and connected to each of

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the sensors, and a second monitoring unit located outside the vessel, the first monitoring unit comprising means for converting sensor output signals into transmission signals which are transmissible through the vessel wall, and the second monitoring unit comprising means for detecting the transmission signals outside the vessel walls and deriving data representative of conditions within the vessel from the transmission signals.

16. A system according to claim 15, wherein means are provided for transmitting a power signal from outside the vessel to the first monitoring unit, the first monitoring unit comprising a detector arranged to detect the power signal and a power supply energised by the detected power signal.

17. A system according to claim 16, wherein the first monitoring unit comprises an antenna and an associated detector circuit tuned to a predetermined frequency, and a power signal is transmitted at the predetermined frequency.

18. A system according to any one of claims 15 to 17, wherein the vessel incorporates a window, and the first monitoring unit is arranged to transmit optical transmission signals through the window to the second monitoring unit.

19. A system according to claim 18, wherein the first monitoring unit comprises a laser to generate the optical transmission signals.

20. A system according to claim 18 or 19, wherein the optical transmission signals are infra-red signals.

21. A system according to claim 15, 16 or 17, wherein the transmission signals are radio telemetry signals to which at least a part of the vessel wall is transparent.

22. A system according to any one of claims 15 to 21, wherein the plurality of sensors are carried by a sheet which is secured on the inside face of the vessel wall;

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the sensors being connected to the first monitoring unit by conductive tracks formed on the sheet.

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